VERITAS NetBackup™ 4.5 for Lotus Notes

System Administrator's Guide

on Windows NT/Windows 2000

March 2002
30-000505-011

VERITAS

Disclaimer

The information contained in this publication is subject to change without notice. VERITAS Software Corporation makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. VERITAS Software Corporation shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual.

Copyright

VERITAS Software Corporation
350 Ellis Street
Mountain View, CA 94043
USA
Phone 650-527-8000
Fax 650-527-8050
www.veritas.com

Contents

Preface

This guide explains how to configure and use NetBackup for Lotus Notes for Windows to perform online backups and restores of Lotus databases.

For specific information about the NetBackup Server software, refer to *NetBackup System Administrator's Guide for Windows* if you have a Windows server or the *NetBackup System Administrator's Guide for UNIX* if you have a UNIX server.

This document is the same as NetBackup_AdminGuide_LotusNotes_NT.pdf distributed with the NetBackup for Lotus Notes for Windows software.

Audience

This guide is intended for system administrators responsible for configuring and maintaining systems using Lotus databases.

This guide assumes:

- A basic understanding of system administration.
- A working understanding of the NetBackup client and server software and familiarity with the information covered in the following NetBackup manuals:
  - *NetBackup User's Guide for Microsoft Windows*
  - If you are using a UNIX server, *NetBackup System Administrator's Guide for UNIX* and *NetBackup Troubleshooting Guide for UNIX*.
  - If you are using a Windows server, *NetBackup System Administrator's Guide for Windows* and *NetBackup Troubleshooting Guide for Windows*.
- A thorough understanding of the following Lotus topics:
  - Database file types and their relationships at recovery time
  - Data recovery scenarios

Organization

This guide is organized as follows:

- Chapter 1, "Introduction", describes the features of NetBackup for Lotus Notes for Windows.
- Chapter 2, "Installing NetBackup for Lotus Notes for Windows", provides details on installing NetBackup for Lotus Notes for Windows.
- Chapter 3, "Configuration", provides details for configuring NetBackup for Lotus Notes for Windows.
- Chapter 4, "Operating Instructions", contains a description of NetBackup backup and restore options for NetBackup for Lotus Notes for Windows. It also contains troubleshooting tips.
- Chapter 5, "Troubleshooting NetBackup", offers a comprehensive set of debug logs for troubleshooting problems that may occur during NetBackup operations.

Related Documents

The following documents provide related information. For a more detailed listing of NetBackup documents, refer to *NetBackup Release Notes*.

If you have a UNIX server, refer to these documents:

- *NetBackup System Administrator's Guide for UNIX*

  Explains how to configure and manage NetBackup on a UNIX system.

- *NetBackup Media Manager System Administrator's Guide for UNIX*

  Explains how to configure and manage the storage devices and media on UNIX NetBackup servers. Media Manager is part of NetBackup.

- *NetBackup Troubleshooting Guide for UNIX*

  Provides troubleshooting information for UNIX-based NetBackup products. You can also refer to `www.support.veritas.com`, access the Knowledge Base Search option, and search for TechNotes.

If you have a Windows server, refer to these documents:

- *NetBackup System Administrator's Guide for Windows*

  Explains how to configure and manage NetBackup on a Windows server system.

- *NetBackup Media Manager System Administrator's Guide for Windows*

  Explains how to configure and manage the storage devices and media on Windows NetBackup servers. Media Manager is part of NetBackup.

- *NetBackup Troubleshooting Guide for Windows*

  Provides troubleshooting information for Windows-based NetBackup products. You can also refer to `www.support.veritas.com`, access the Knowledge Base Search option, and search for TechNotes.

Accessibility

NetBackup contains features that make the user interface easier to use by people who are visually impaired and by people who have limited dexterity. Accessibility features include:

- Support for assistive technologies such as screen readers and voice input (Windows servers only)
- Support for keyboard (mouseless) navigation using accelerator keys and mnemonic keys

For more information, see the NetBackup system administrator's guide.

Conventions

The following explains typographical and other conventions used in this guide.

Type Style

Typographic Conventions

Typeface	Usage
`Bold fixed width`	Input. For example, type **`cd`** to change directories.
`Fixed width`	Paths, commands, filenames, or output. For example: The default installation directory is `/opt/VRTSxx`.
Italics	Book titles, new terms, or used for emphasis. For example: *Do not* ignore cautions.
Sans serif (italics)	Placeholder text or variables. For example: Replace *filename* with the name of your file.
Serif (no italics)	Graphical user interface (GUI) objects, such as fields, menu choices, etc. For example: Enter your password in the **Password** field.

Notes and Cautions

Note This is a Note. Notes are used to call attention to information that makes using the product easier or helps in avoiding problems.

Caution This is a Caution. Cautions are used to warn about situations that could cause data loss.

Key Combinations

Some keyboard command sequences use two or more keys at the same time. For example, holding down the **Ctrl** key while pressing another key. Keyboard command sequences are indicated by connecting the keys with a plus sign. For example:

Press Ctrl+t

Command Usage

The following conventions are frequently used in the synopsis of command usage.

brackets [ ]

The enclosed command line component is optional.

Vertical bar or pipe (|)

Separates optional arguments from which the user can choose. For example, when a command has the following format:

command *arg1*|*arg2*

the user can use either the *arg1* or *arg2* variable.

Terms

The terms listed in the table below are used in the VERITAS NetBackup documentation to increase readability while maintaining technical accuracy.

Term	Definition
Microsoft Windows, Windows	Terms used as nouns to describe a line of operating systems developed by Microsoft, Inc. A term used as an adjective to describe a specific product or noun. Some examples are: Windows 95, Windows 98, Windows NT, Windows 2000, Windows servers, Windows clients, Windows platforms, Windows hosts, and Windows GUI. Where a specific Windows product is identified, then only that particular product is valid with regards to the instance in which it is being used. For more information on the Windows operating systems that NetBackup supports, refer to the VERITAS support web site at `http://www.support.veritas.com`.
Windows servers	A term that defines the Windows server platforms that NetBackup supports; those platforms are: Windows NT and Windows 2000.

Term	Definition
Windows clients	A term that defines the Windows client platforms that NetBackup supports; those platforms are: Windows 95, 98, ME, NT, 2000, XP (for 32- and 64-bit versions), and LE.

Getting Help

For updated information about this product, including system requirements, supported platforms, supported peripherals, and a list of current patches available from Technical Support, visit our web site:

`http://www.support.veritas.com/`

VERITAS Customer Support has an extensive technical support structure that enables you to contact technical support teams that are trained to answer questions to specific products. You can contact Customer Support by sending an e-mail to support@veritas.com, or by finding a product-specific phone number from the VERITAS support web site. The following steps describe how to locate the proper phone number.

1. Open `http://www.support.veritas.com/` in your web browser.
2. Click **Contact Support**. The *Contacting Support Product List* page appears.
3. Select a product line and then a product from the lists that appear. The page will refresh with a list of technical support phone numbers that are specific to the product you just selected.

Introduction 1

NetBackup for Lotus Notes for Windows extends the capabilities of NetBackup to include online backups and restores of Lotus databases when Lotus Domino R5 has been installed. This capability is provided as an add-on or extension to the NetBackup for Windows client software. Because this product is tightly integrated with the Backup, Archive, and Restore interface for Windows, this document only gives an overview of NetBackup functionality. In general, backup and restore operations for Lotus database files are identical to other NetBackup file operations, except where noted in this document.

Features

Online Backup	Lotus databases and transaction logs can be backed up without taking down the server. This ensures the availability of Lotus services and data during the Lotus backup.
Restore Operations	Using a few simple operations, an administrator using the NetBackup client can browse Lotus database backups and select the ones to be restored.
Transaction Logging	NetBackup for Lotus Notes for Windows takes advantage of the ability of Lotus Domino R5 to log transactions against one or more Lotus R5 databases. Transaction Logging may be either circular style or archive style.
Point in Time Recovery	Transaction logging enables NetBackup for Lotus Notes for Windows to perform a point-in-time recovery of a logged Lotus R5 database(s).
Tight NetBackup Integration	Tight integration with NetBackup means two things: ◆ An administrator already familiar with NetBackup procedures and software will have no problems configuring and using NetBackup to perform backup and restore operations for Lotus databases and transaction log extents. ◆ All of the rich features and strengths of the NetBackup product suite are available to the Lotus database backup user.
Central Administration	Administrators can define Lotus Notes policies, back up and restore Lotus databases, and back up and restore archive style transaction log extents from a central location.
Media Management	Lotus database backups are saved directly to a wide variety of storage devices supported by the NetBackup master server.
Automated Backups	Administrators can set up schedules for automatic, unattended backups for local or remote clients across the network. These backups can be full or incremental and are managed entirely by the NetBackup server from a central location. The administrator can also manually back up clients.

Domino Partitioned Server Backup	Administrators can back up databases from Domino partitioned servers by specifying that the `NOTES_INI_PATH` = file list directive in the NetBackup file list. Users can restore databases backed up from Domino partitioned servers by specifying the absolute path for the `NOTES.INI` file that is associated with the server instance to be used by the restore. This path can be specified in the Lotus Notes tab on the Restore Marked Files dialog box.

Lotus Database

Lotus Database Configurations

NetBackup for Lotus Notes for Windows supports the backup and restore of three database configurations that are supported by Lotus. These configurations can be divided into two categories: Domino Server databases and Local databases.

Domino Server Databases

Domino Server databases are managed by the Domino Server. Domino Server databases are located at or in another folder in the Domino data folder, for example, `C:\Lotus\Domino\Data`. Domino Server databases may also be linked to this Domino data directory using Lotus Linked Directories or Databases. Domino Server databases can be Logged or Unlogged.

Logged Domino Server Databases

A feature of Domino R5 Server is the ability to log transactions against one or more Lotus databases. If transaction logging is enabled on the server, all logged database transactions go into a single transaction log, consisting of one or more files or extents. Where archive style transaction logging is used, the archived log files serve as the incremental backup for the logged databases. Transaction logging must be enabled in order to initiate the recovery of logged databases using NetBackup for Lotus Notes for Windows.

Unlogged Domino Server Databases

An unlogged database is one in which transaction logging is not enabled, or has been disabled for specific server database(s).

Unlogged Domino Server databases will be backed up when a full backup is performed. Unlogged Domino Server databases will also be backed up when a differential incremental backup or cumulative incremental backup is performed and the Unlogged Domino server database has been recently updated. The database can be restored only to the point of the latest database backup.

Local Databases

Local databases are Lotus databases that are not located in the Domino data folder, cannot be shared, and cannot be logged. Local databases will be treated similarily to unlogged Domino Server databases when being backed up and restored.

Lotus Database Files

This section describes the set of files that may be backed up during a backup operation.

Database Files

NetBackup for Lotus Notes for Windows will support the following database types:

`.NTF` Lotus Notes Template Files

`.NSF` Lotus Notes Server Files

`.BOX` Lotus Mail Box Files

Transaction Logs

Lotus Domino Server R5 has the ability to log transactions against one or more Lotus R5 databases. Because transactions cannot be logged against database versions earlier than Domino R5, these pre-R5 Lotus databases will be treated as unlogged databases.

All Lotus R5 databases are logged by default when:

- Transaction logging is enabled by the administrator.
- The database is in the Domino data directory.

All logged database transactions go into a single transaction log, consisting of one or more files or extents.

Transaction logging may be of either circular style or archive style. When archive style transaction logging is used, the archive log files may serve as the incremental backup for logged databases.

Note Transaction logging must be enabled in order to implement the recovery of logged Lotus databases.

Circular and Archive Style Logging

When logging is enabled on the Domino Server, one of two styles of logging can be selected for all logged databases: circular or archive style logging.

When circular style logging is enabled, the transaction log extents are reused as the specified log file size is reached. By reusing the transaction log extents, you are saving resources, but limiting your recovery options. It is important to remember that transaction log extents are NOT backed up by NetBackup for Lotus Notes for Windows when circular style logging is enabled. Therefore, you will be able to recover logged Lotus databases only back to the point in time when the circular transaction log extents were overwritten.

When archive style logging is enabled, transaction log extents are generated as needed and are limited in number only by the capacity of your mass storage. Unlike circular style transaction log extents, which cannot be backed up, archive style transaction log extents must be backed up and may be used as the incremental backup for all logged databases. Backing up the archive style transaction log extents is the only way to ensure that the transaction log extents are marked as available to be recycled and to prevent your mass storage from filling up. Unlike circular style logging, archive style logging does not limit the point in time to which a database may be recovered. With archive style logging enabled, a logged database may be recovered to any point in time, from the time the database itself was last backed up to the current time.

Recycling Transaction Log Extents

Following either a full backup or differential incremental backup, NetBackup for Lotus Notes for Windows will mark the successfully backed up transaction log extents as ready to be recycled. The NetBackup for Lotus Notes for Windows agent does not perform the actual deletion of the successfully backed up transaction log extents, since the Domino server manages when a transaction log extent is actually recycled.

Backup Operations

This section presents overview information on NetBackup for Lotus Notes for Windows backup operations.

Requirements

- Lotus Domino Server R5 must be installed on the NetBackup client before a backup operation can be performed.
- Transaction logging must be enabled in order to initiate the recovery of logged databases.

Methods

NetBackup provides three methods to perform backups: automatic, manual, and user-directed. This section contains an overview of these methods. For more information on these backup methods and other administrator-directed activities, refer to the *NetBackup System Administrator's Guide for UNIX* if you are using a UNIX server or to the *NetBackup System Administrator's Guide for Windows* if you are using a Windows server.

Automatic Backups

The NetBackup administrator can schedule backups that occur automatically and unattended, under the control of the NetBackup master server. Automatic backups will meet most of your backup requirements.

Manual Backups

The manual backup allows the administrator to initiate a full backup, cumulative incremental backup or differential incremental backup that has been set up in the policy manager. The manual backup option can be useful for the following situations:

- Testing a configuration
- When workstations miss their regular backups
- Before installing new software (to preserve the old configuration)
- Preserving records before a special event such as when companies split or merge

In some cases, it may be useful to create a policy and schedule that you use only for manual backups. You can do this by creating a policy with a single schedule that has no backup window defined (and therefore never executes automatically).

User-Directed Backups

User-directed backups require a User Backup schedule type to be defined in the Lotus-Notes policy. Performing user-directed backups of Lotus databases is similar to using the Backup, Archive, and Restore interface to back up normal files. The example described in “Performing a Backup” on page 46 uses the Backup, Archive, and Restore interface to perform an online backup of a Lotus database.

Actions performed for a user backup of Lotus databases and transaction log extents are identical to a full backup except that the transaction log extents are not marked as ready to be recycled after they are successfully backed up. Because transaction log extents are not recycled, user backups are like taking a snapshot of the databases at a given point in time without impacting the content of ongoing full and incremental backups. A user backup is not automatically scheduled and must be initiated on the target client machine.

Restore and Recovery Operations

Using a few simple operations, an administrator using the NetBackup client can browse NetBackup for Lotus Notes backups and select the ones to be restored and recovered.

NetBackup for Lotus Notes for Windows will support both restore and recovery operations. A restore operation will allow a user to restore any previously backed up Lotus databases. The operations performed during a database restore are:

- the existing database is taken offline and deleted
- the database is restored
- changed records recorded during the backup of the database are restored and applied to the database, and if the database is unlogged or local the database is brought back online

  If the database is a logged database, the database name is added to a list for recovery after all databases (unlogged / local and logged) have been restored.

Following the restore operation, the recovery operation will begin automatically and will attempt to recover all logged databases restored during the restore operation. The logged databases that have been restored will be rolled forward to a specific point in time using the appropriate transactions from the required transaction logs, before being brought back online. As part of the recovery operation, any required transaction logs that have been previously backed up and recycled will be restored automatically as part of the recovery operation. In general, it is recommended that required transaction log extents be restored automatically as part of the recovery operation rather than being restored manually by the user.

Requirements

- Transaction logging must be enabled in order to implement the recovery of logged databases.

Methods

NetBackup provides three methods to perform restores:

- server-directed
- redirecting a restore to a different client
- redirecting a restore to a different path

These methods are supported in the Restore and Recovery Operations. An overview of these methods is given in the following sections. For more information on these restore methods and other administrator-directed activities, refer to the *NetBackup System Administrator's Guide for UNIX* or *NetBackup System Administrator's Guide for Windows*.

Server-Directed Restore

An administrator can browse NetBackup for Lotus Notes for Windows files and select the ones to be restored. When the administrator initiates the restore, the request is passed from the client to the NetBackup master server. Once the server validates the request, the restore operation becomes fully managed by the server, which identifies the storage device and the volume containing the Lotus databases by querying the NetBackup database. The server then transmits the data back to the client.

NetBackup restores Lotus databases and transaction log extents from a range of backups. By default, this range includes the last full backup and all cumulative incremental backups or differential incremental backups since that full backup.

NetBackup will allow you to select the NetBackup server from which files will be restored, to view the backup history, and to select items to restore for:

- a specific client
- other clients that were backed up by the selected NetBackup server

Redirecting a Restore to a Different Client

Files or folders can be restored to a client other than the one from which they were backed up. This is possible only if the NetBackup administrator sets up the configuration to allow it and the NetBackup for Lotus Notes agent has been installed on the alternate client. The administrator using the NetBackup Administration Console on the master server or using the Remote Administration Console can direct restores to any NetBackup client (regardless of which client the files came from). Please see the appropriate NetBackup manuals for the configuration needed for this type of redirected restore.

Redirecting a Restore to a Different Path

A user can restore Lotus database files to folders that are different from the folders from which the databases were backed up.

Installing NetBackup for Lotus Notes for Windows 2

This chapter describes the NetBackup for Lotus Notes for Windows installation procedure.

Installing NetBackup for Lotus Notes for Windows

The following is the procedure for installing NetBackup for Lotus Notes for Windows.

Installation Requirements

- A valid license key for NetBackup for Lotus Notes for Windows must be registered on the master or media server. License keys can be added from the NetBackup Administration Console. From the **Help** menu, choose **License Keys**.
- The version of the NetBackup Client and the version of NetBackup for Lotus Notes for Windows must be the same (e.g., 4.5).

▼ To install NetBackup for Lotus Notes for Windows:

1. Insert the NetBackup CD-ROM into the drive.
   - On systems with AutoPlay enabled for CD-ROM drives, the NetBackup install program starts automatically.
   - On Windows NT 4.0 or Windows 2000 systems that have AutoPlay disabled, run the `Launch.exe` program in the root directory on the CD-ROM.
2. Below the "Main Menu" on the left, click **Database Agents**.
3. Click **Database Agent Installation**.
4. Click **Lotus Notes**.
5. Click **Next** and follow the prompts in the setup program.

Configuration 3

This section provides an overview of how to configure NetBackup to perform backup and restore operations for Lotus databases and transaction log extents.

To use NetBackup for Lotus Notes for Windows, you must add at least one Lotus-Notes policy to NetBackup, then define the appropriate schedules for that policy.

This chapter contains information on the following topics:

- Configuring the Windows Registry for NetBackup for Lotus Notes
- Configuration Using the NetBackup Administration Console
- Configuring a NetBackup Policy
- Testing NetBackup for Lotus Notes for Windows Configuration Settings

Most requirements for Lotus-Notes policies are the same as for file system backups. Refer to the *NetBackup System Administrator's Guide for UNIX* or the *NetBackup System Administrator's Guide for Windows* for detailed configuration instructions.

Configuring the Windows Registry for NetBackup for Lotus Notes

NetBackup for Lotus Notes on Windows needs to know the pathname where the Lotus program files reside. The program will extract the path from the following key in the Lotus registry.

```
[HKEY_LOCAL_MACHINE] SOFTWARE\Lotus\Domino\Path
```

If this key is not defined, or the value of the key is not correctly set, define the path in the properties for the client. See “If the Registry Key is Not Defined or is Not Correctly Set” on page 16.

Lotus Notes Registry Key Values

The Windows NetBackup Configuration Registry contains two values that support the Lotus Notes Database Agent: `LOTUS_NOTES_PATH` and `LOTUS_NOTES_INI`.

LOTUS_NOTES_PATH

The first value is called `LOTUS_NOTES_PATH`. Netbackup for Lotus Notes for Windows needs to know the path where the Lotus program files reside. This path is extracted from the Lotus Registry by the Netbackup for Lotus Notes Agent. The agent will look in the Lotus registry for the value `[HKEY_LOCAL_MACHINE] SOFTWARE\Lotus\Domino\Path`.

If the Lotus registry value is not defined or the value is not set appropriately, the user should create the following VERITAS registry value. The VERITAS registry value should be set to the path where the Lotus program files are located and will override the Lotus registry value, if both are defined.

Registry Sample:

```
Key:          [HKEY_LOCAL_MACHINE]
      SOFTWARE\VERITAS\NetBackup\CurrentVersion\Config
Value:        LOTUS_NOTES_PATH
Value Data:   D:\Lotus\Domino   (sample)
```

LOTUS_NOTES_INI

The second value is called `LOTUS_NOTES_INI`. Netbackup for Lotus Notes for Windows needs to know where the Lotus Notes INI file (`notes.ini`) is located. The VERITAS registry value should be set to the path where the Lotus Notes INI file is located.

Registry Sample:

```
Key:          [HKEY_LOCAL_MACHINE]
```

```
      SOFTWARE\VERITAS\NetBackup\CurrentVersion\Config
Value:       LOTUS_NOTES_INI
Value Data:  D:\Lotus\domino\notes.ini   (sample)
```

Using REGEDIT32 to Add Registry Values

The registry values above can be added with the VERITAS Configure NetBackup Program or by using the Windows utility programs REGEDIT or REGEDT32. The VERITAS Configure Netbackup Program is not supported on UNIX. When a UNIX Master Server is being used it will be necessary for the registry to be set manually by using REGEDIT or REGEDT32.

▼ To add the registry values using REGEDIT32

1. Click on the Windows **Start** menu and click **Run**.
2. In the **Run** box, type **REGEDT32** and press Enter.

   The REGEDT32 program opens.
3. Select the HKEY_LOCAL_MACHINE key.
4. Navigate the tree and select the following key:

   `SOFTWARE\VERITAS\NetBackup\CurrentVersion\Config`
5. Click on the Config key.
6. To add a new value, from the **Edit** menu, select **Add Value**.

   The Add Value dialog box appears.
7. Set the **Value Name** to LOTUS_NOTES_PATH.
8. Select **REG_SZ** for the Data Type.
9. Press **OK** to add the value.

   The String Editor dialog box appears.
10. Type the value data, for example, `D:\Lotus\Domino`.
11. Press **OK** to accept the value.
12. Repeat this process for the LOTUS_NOTES_INI value.

If the Registry Key is Not Defined or is Not Correctly Set

If the Lotus registry key is not defined, or the value of the key is not correctly set, define the path in the properties for the client as described below.

▼ To define the Lotus Notes path

1. Open the NetBackup Administration Console.
2. Expand **Host Properties**.
3. Click on **Clients**.
4. In the right pane, right-click on the client and click **Properties**.
5. Click on the **Lotus Notes** tab.
6. In the **Path** box, specify the path where the Lotus program files reside.
7. Click **OK** to save your changes.

Configuration Using the NetBackup Administration Console

Although the database agent is installed on the NetBackup client, some configuration procedures are performed using the NetBackup Administration Console on the server.

These procedures include:

- Configuring a NetBackup policy
- Testing NetBackup for Lotus Notes for Windows configuration settings

See the next section for instructions on starting the NetBackup Administration Console.

Starting the NetBackup Administration Console

The following sections contain information on launching the Windows server version and the Unix server version of the NetBackup Administration Console.

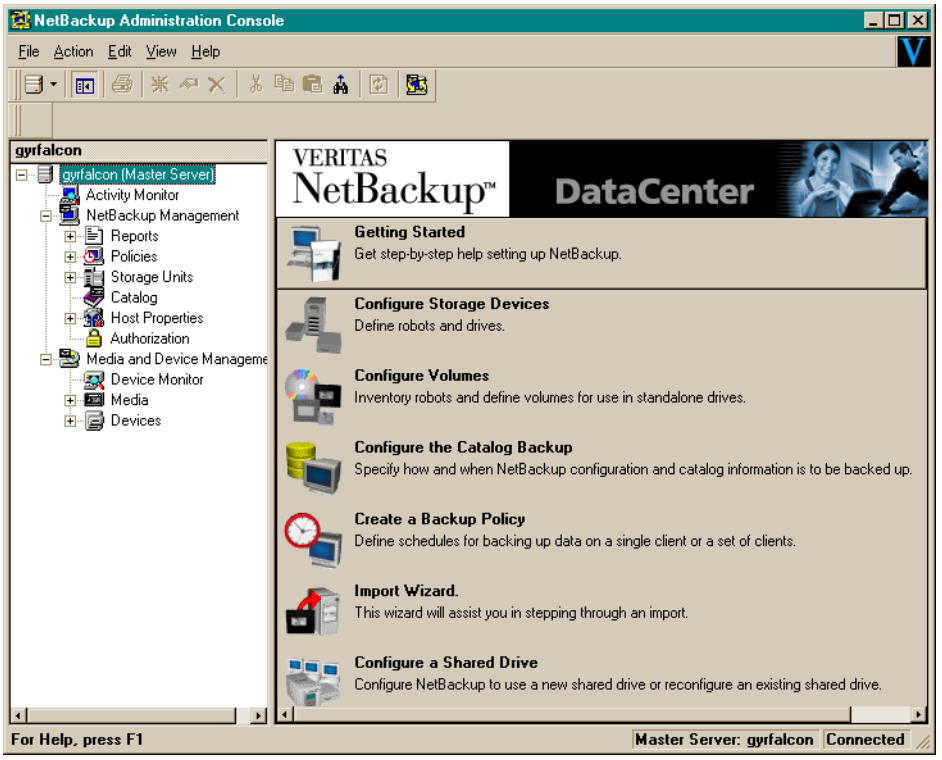
Starting the NetBackup Administration Console for Windows

This section contains information on launching the Windows server version of the NetBackup Administration Console.

▼ **To launch the NetBackup Administration Console for Windows**

1. Log on to the server as administrator.
2. From the Windows **Start** menu, point to **Programs**, point to **VERITAS NetBackup** and click **NetBackup Administration Console**.

The NetBackup Administration Console appears.



Starting the NetBackup Administration Console for UNIX

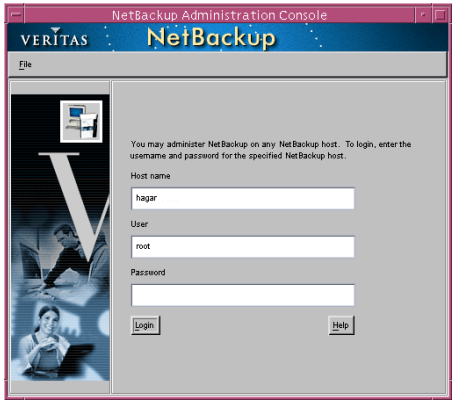
This section contains information on launching the Unix version of the NetBackup Administration Console.

▼ To launch the NetBackup Administration Console for UNIX

1. Log onto the UNIX server as root.
2. Start the NetBackup Administration Console by executing:

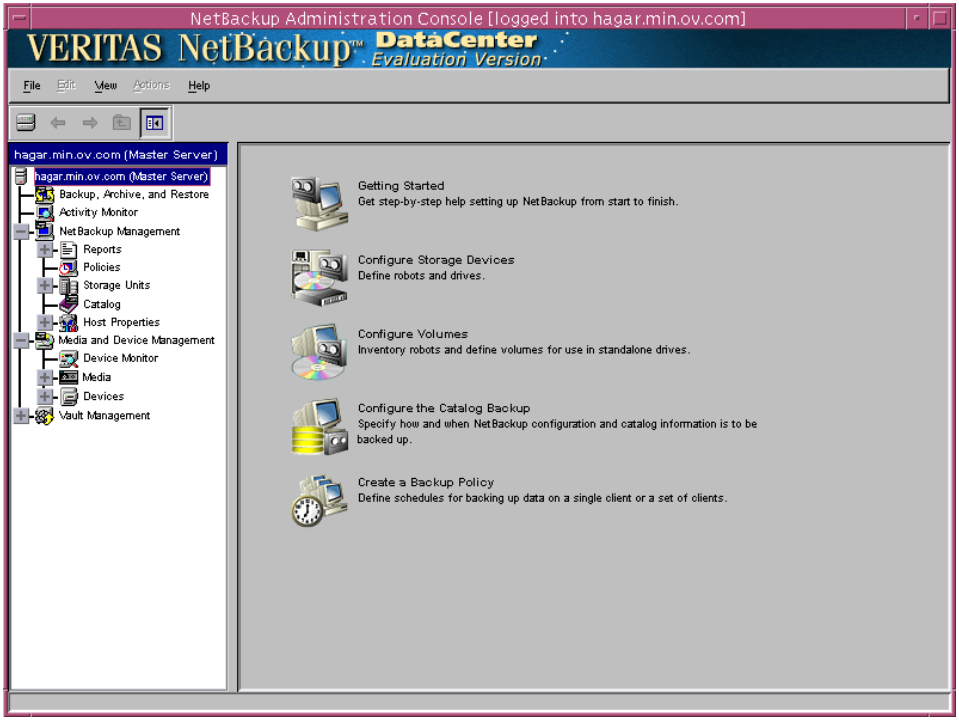
   install_path`/netbackup/bin/jnbSA &`

The Login dialog box appears.



3. Type the name of the master server where you initially want to manage NetBackup. You can specify any NetBackup master server. Indicate the User and Password.

4. Click **Login**. The NetBackup Administration Console appears.



Configuring a NetBackup Policy

A NetBackup policy defines the backup criteria for a specific group of one or more clients. These criteria include:

- policy attributes
- backup schedules
- items to be backed up, including a list of databases and file list directives
- clients to be backed up

To use NetBackup for Lotus Notes for Windows, at least one Lotus-Notes policy with the appropriate schedules needs to be defined. A configuration can have a single policy that includes all clients or there can be many policies, some of which include only one client.

Most requirements for Lotus-Notes policies are the same as for file system backups. In addition to the attributes described here, there are other attributes for a policy to consider. Refer to the *NetBackup System Administrator's Guide* for detailed configuration instructions and information on all the attributes available.

The following sections give descriptions for the types of attributes, schedule properties, backups, and file list entries that you will need to use to configure a Lotus-Notes policy.

Description of Attributes

With a few exceptions, NetBackup manages a database backup like a file system backup. Policy attributes that are different for Lotus backups are explained below. This information is used when you are adding a new policy using either a Windows server (refer to "Adding New Policies" on page 26) or a UNIX server (refer to "Adding New Policies" on page 36).

Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* for detailed explanations of the policy attributes.

Description of Policy Attributes

Attribute	Description
Policy type	Determines the type of clients that can be in the policy and in some cases the types of backups that can be performed on those clients. To use NetBackup for Lotus Notes for Windows, you must have defined at least one Lotus-Notes policy.
Keyword phrase	A textual description of a backup. Useful for browsing backups and restores.

Description of Policy Attributes

Attribute	Description
Allow multiple data streams	Specifies that, depending on directives in the file list, NetBackup can divide automatic backups for each client into multiple jobs, with each job backing up only a part of the file list. The jobs are in separate data streams and can occur concurrently. The number of available storage units, multiplex settings, and the maximum jobs parameters determines the total number of streams and how many can run concurrently.

Schedule Properties

Some of the schedule properties have a different meaning for database backups than for a regular file system backup. These properties are explained below. This information is used when you are adding a new schedule using either a Windows server (refer to "Adding New Schedules" on page 28) or a UNIX server (refer to "Adding New Schedules" on page 38).

Other schedule properties will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* for detailed explanations of the schedule properties.

Description of Schedule Properties

Property	Description
Type of backup	Specifies the type of backup that this schedule will control. The selection list shows only the backup types that apply to the policy you are configuring. For more information see "Types of Backups."
Frequency	This setting is used only for scheduled backups, and not for user-directed backups. **Frequency** specifies the period of time that will elapse until the next backup operation can begin on this schedule. For example, if the frequency is seven days and a successful backup occurs on Wednesday, the next full backup will not occur until the following Wednesday. Normally, incremental backups will have a shorter frequency than full backups.
Calendar	This setting is used only for scheduled backups, and not for user-directed backups. The **Calendar** option allows you to schedule backup operations based on specific dates, recurring week days, or recurring days of the month.

Description of Schedule Properties

Property	Description
Retention	Specifies a retention period for keeping backup copies of files before deleting them. Set the time period to retain at least two full backups of your database. In this way, if one full backup has been lost, you will have another full backup to fall back on. For example, if your database is backed up once every Sunday morning, you should select a retention period of at least 2 weeks.

Types of Backups

This information is used when you are adding a new schedule using either a Windows server (refer to "Adding New Schedules" on page 28) or a UNIX server (refer to "Adding New Schedules" on page 38).

The types of backups that can be performed are described in the following table:

Description of Types of Backups

Type of Backup	Description
Full backup	This backup type is used to automatically back up all the Lotus databases identified in the file list and / or the available transaction logs extents if the `BACKUP_TRANSACTION_LOGS` directive is encountered in the file list. All transaction log extents, identified as available for backup by the Domino server, will be marked as ready to be recycled after they are successfully backed up. The Domino server handles the actual recycling of transaction log extents.

Description of Types of Backups

Type of Backup	Description
Differential-incremental backup	A differential-incremental backup will perform differently depending on the type of Lotus database encountered. - unlogged databases or local databases A differential-incremental backup will back up all unlogged or local databases identified in the file list that have been modified since the last full or incremental backup. The last modification date is determined by the time the database was last modified, not the time / date stamp of the database file. - logged databases (archival-style logging enabled) A differential-incremental backup will back up only those logged databases identified in the file list that have been assigned a new DBIID since the last full or incremental backup. - logged databases (circular-style logging enabled) A differential-incremental backup will back up all logged databases identified in the File list that have been modified since the last full or incremental backup. The last modification date is deterrmined by the time the database was last modified, not the time / date stamp of the database file. - transaction logs When the `BACKUP_TRANSACTION_LOGS` file list directive is encountered in the file list, a differential-incremental backup will back up all transaction log extents identified as available for backup by the Domino server. The transaction log extents that are backed up will be marked as ready to be recycled upon successful completion of the backup.

Description of Types of Backups

Type of Backup	Description
Cumulative-Incremental backup	A cumulative-incremental backup will perform differently depending on the type of Lotus database encountered. - unlogged databases or local databases A cumulative-incremental backup will automatically backup all unlogged or local databases identified in the file list that have been modified since the last full backup. The last modification date is determined by the time the database itself was modified, not the time / date stamp of the database file. - logged databases (archival-style logging enabled) A cumulative-incremental backup will automatically backup only those logged databases identified in the file list that have been assigned a new DBIID since the last full backup. - logged databases (circular-style logging enabled) A cumulative-incremental backup will back up all logged databases identified in the File list that have been modified since the last full or incremental backup. The last modification date is deterrmined by the time the database was last modified, not the time / date stamp of the database file. - transaction logs When the `BACKUP_TRANSACTION_LOGS` file list directive is encountered in the file list, a cumulative-incremental backup will automatically back up all transaction log extents identified as available for backup by the Domino server. The transaction log extents will not be marked as ready to be recycled upon successful completion of the backup.
User backup	Actions performed for a user backup are identical to a full backup except that the transaction log extents are not marked as ready to be recycled after they are successfully backed up. Because transaction log extents are not recycled, user backups are like taking a snapshot of the databases and transaction log extents at a given point in time without impacting the content of ongoing full and incremental backups. A user backup is not automatically scheduled and must be initiated on the target client machine. You may want to consider creating a separate policy for User Backup schedule types. This will allow you to easily separate user-directed and scheduled backups when restoring files. If you decide to create separate policies for User Backup schedule types, the considerations are similar to those for automatic backups. One difference is that you do not need a file list because users select the files before starting the operation.

File List Directives

This information is used when you are adding Lotus Notes directives to the file list using either a Windows server Windows server (refer to “Adding New File List Entries” on page 32) or a UNIX server (refer to “Adding New File List Entries” on page 40).

The types of directives that can be added to the file list are described in the following table:

File List Directives

Directive	Description
ALL_LOTUS_DATABASES	This directive is not supported for NetBackup for Lotus Notes for Windows.
BACKUP_TRANSACTION_LOGS	Backs up all transaction log extents identified by the Domino server as available for backup.
NOTES_INI_PATH=	If you are configuring a backup from Domino partitioned servers, use this directive, where: NOTES_INI_PATH = the *absolute path for the NOTES.INI file associated with the server instance to be used* This file list directive identifies the location of the NOTES.INI file associated with the particular server partition that will be used to perform the backup. The server partition specified will have an impact on the how a database is backed up (logged or unlogged) and which set of transaction log extents will be backed up.
NEW_STREAM	To perform a scheduled backup of more than one Domino partitioned server from a single policy, you must back up each Domino partitioned server with a separate data stream. Use the NEW_STREAM file list directive and the appropriate NOTES_INI_PATH= file list directive for each data stream. The NEW_STREAM file list directive is used to define a single stream for a particular partition of a Domino partitioned server, and multiple streams for a single partition on a non-partitioned Domino server. For more information on the NEW_STREAM file list directive, see the *NetBackup System Administrator’s Guide for Windows* or *NetBackup System Administrator’s Guide for UNIX*.

NetBackup Administration Console for Windows

The following procedures can be performed to add and configure a policy:

- Adding New Policies
- Adding New Schedules
- Adding New File List Entries
- Adding Clients to a Policy

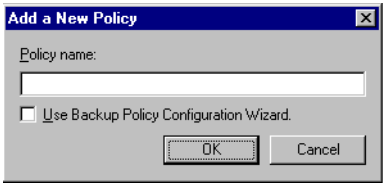
Adding New Policies

Use this procedure when configuring a policy from a Windows server or from a NetBackup Remote Administration Console host.

▼ To add a new policy

1. Log on to the server as administrator.
2. Start the NetBackup Administration Console.
3. If your site has more than one master server, choose the one where you want to add the policy.
4. In the left pane, right-click **Policies**. From the menu, select **New Policy**.

   The Add a New Policy dialog box appears.



   a. In the **Policy name** box, type a unique name for the new policy.

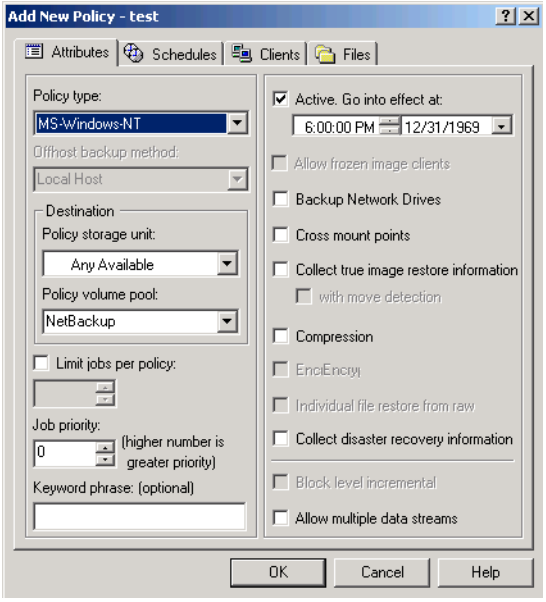
   b. Choose whether to use the wizard for configuring the policy. The wizard guides you through the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy.

      - To use the wizard, select the **Use Backup Policy Configuration Wizard** box and click **OK**. The wizard starts and you create the policy by following the prompts. When prompted, select the Lotus-Notes policy type.

- If you require more control over the settings than the wizard provides, then do not select the **Use Backup Policy Configuration Wizard** box and proceed to step ?.

5. Click **OK**.

   A dialog box appears in which you can specify the general attributes for the policy.



6. From the **Policy Type** box, select the Lotus-Notes policy type.

7. Complete the entries on the **Attributes** tab as explained in “Description of Attributes.”

8. Add other policy information:

   - To add schedules, see “Adding New Schedules.”
   - To add File list entries, see “Adding New File List Entries.”
   - To add clients, see “Adding Clients to a Policy.”

9. Click **OK**. The new policy will be created.

Adding New Schedules

Each policy has its own set of schedules. These schedules control initiation of automatic backups and also specify when user operations can be initiated.

▼ To add a schedule (right-click method)

1. In the left pane, right-click on the name of the policy and select **New Schedule**.

   A dialog box appears. The title bar shows the name of the policy to which you are adding the schedules.

2. Specify a unique name for the schedule.

3. Select the **Type of Backup**.

   For information on the types of backups available for this policy, see "Types of Backups."

4. Specify the other properties for the schedule as explained in "Schedule Properties."

5. Click **OK**.

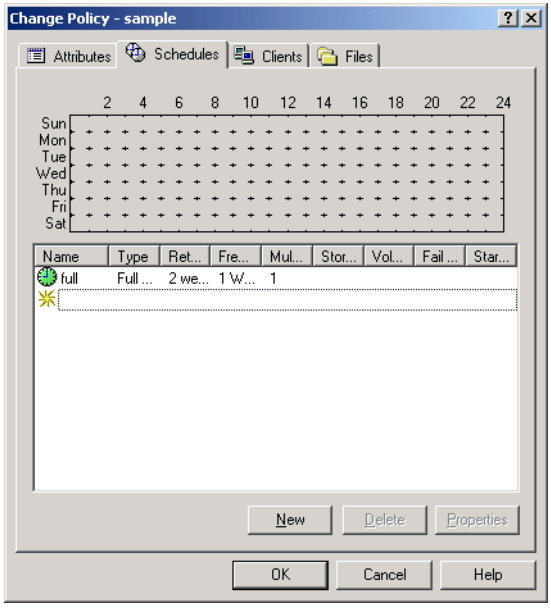
▼ To add a schedule (Add New Policy/Change Policy dialog box method)

1. Schedules can be added using the **Schedules** tab in the Add New Policy and Change Policy dialog boxes:

   - The Add New Policy dialog box is displayed only when you are adding a new policy.

- In the left pane of the NetBackup Administration Console, double-click on the policy name. The Change Policy dialog box is displayed.

  The title bar shows the name of the policy to which you are adding schedules.



2. Click **New** to add a schedule.

3. Select the **Type of Backup**.

   For information on the types of backups available for this policy, see “Types of Backups.”

4. Specify the other properties for the schedule as explained in “Schedule Properties.”

   To add additional schedules, repeat step 2 through step 4.

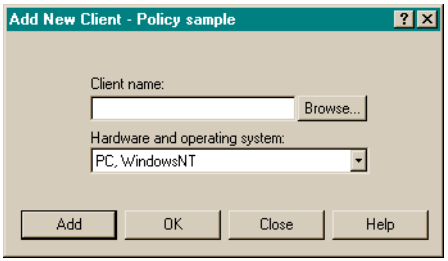
Adding Clients to a Policy

The client list is the list of clients that will be backed up during an automatic backup. A NetBackup client must be in at least one policy but can be in more than one.

▼ To add clients to a policy (right-click method)

1. In the left pane of the NetBackup Administration Console, right-click on the policy name and click **New Client**.

   The Add New Client dialog box appears. The title bar shows the name of the policy to which you are adding the clients.



2. In the **Client name** text box, type the name of the client that you are adding.

   On the client the following should be installed:

   - Lotus database
   - NetBackup for Lotus Notes for Windows

3. Choose the hardware and operating system type.

4. Click **Add**.

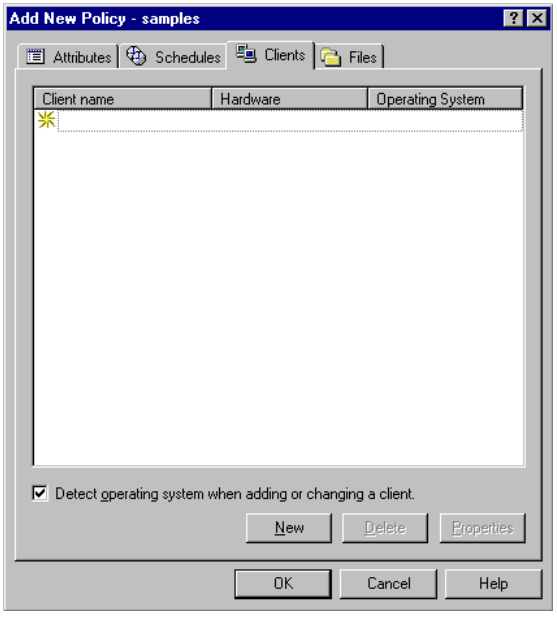
5. To add another client, repeat step 2 through step 4. If this is the last client, click **Close** to close the dialog box.

▼ To add clients to the policy (Add New Policy/Change Policy dialog box method)

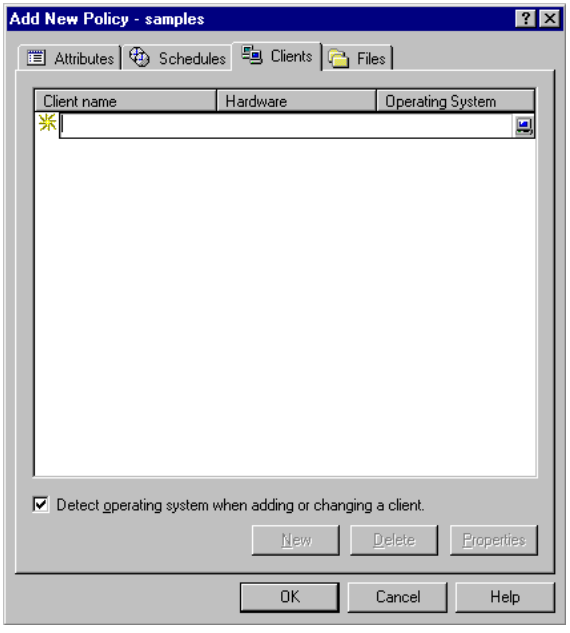
1. Clients can be added to a policy using the Clients tab in the Add New Policy and Change Policy dialog boxes:

   - The Add New Policy dialog box is displayed only when you are adding a new policy.
   - In the left pane of the NetBackup Administration Console, double-click on the policy name. The Change Policy dialog box displays.

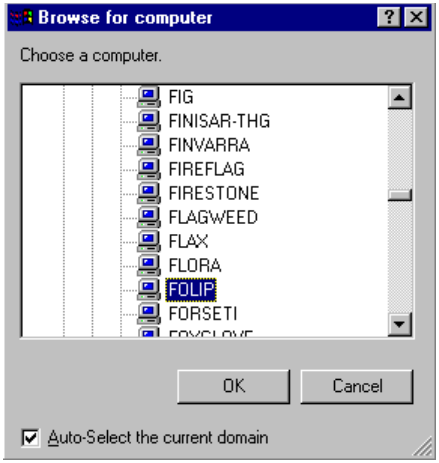
The title bar shows the name of the policy to which you are adding clients.



2. Click **New** to add a client to the policy. Notice that an icon is displayed in the window.



3. Click the icon to browse the list for a client (or type the name of the client).



- Browse for the computer you would like to add to the policy.
- Select the computer name, then click **OK**.
- Press Enter to automatically detect the operating system of the client.

4. Continue adding clients to the policy list as needed. When complete, click the **OK** button. To add more clients, repeat step 2 and step 3.

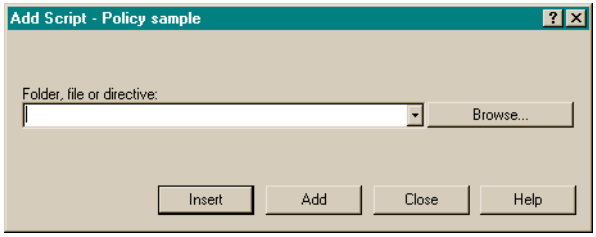
Adding New File List Entries

The following sections explain how to add files or directives to the Files List. Only the files and / or directives specified will be backed up.

▼ To add files, folders, or directives to the Files List (right-click method)

1. In the left pane of the NetBackup Administration Console, right-click on the policy name and click **New File**.

   A dialog box appears. The title bar shows the name of the policy to which you are adding the files.

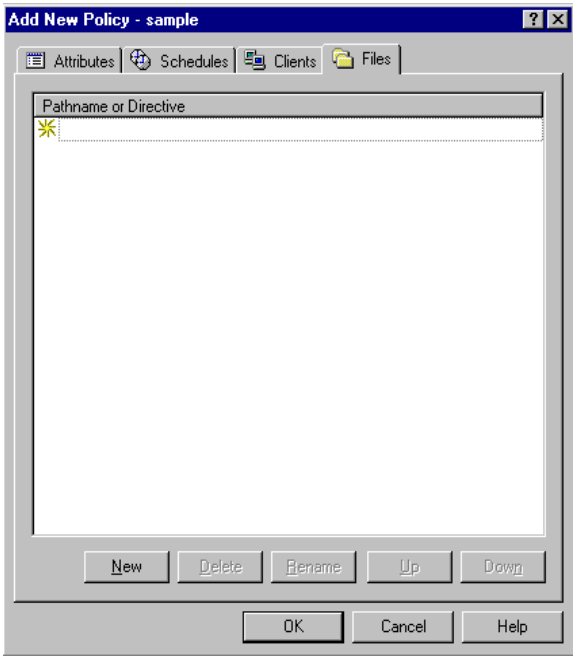


2. Indicate what you wish to back up.
   - To add a folder or file to the file list, type the name of the folder or file in the **Folder, file or directive** text box and click **Add**.
   - To add a directive to the file list, click on the **Folder, file or directive** box, select a directive from the list and click **Add**. For a description of each of the directives, refer to “File List Directives” on page 25.
3. To add additional File list entries, repeat step 2.
4. Click **Close**.
5. Click **Add**.

▼ To add files, folders, or directives to the Files List (Add New Policy/Change Policy dialog box method)

1. Files, folders, or directives can be added using the Files tab in the Add New Policy and Change Policy dialog boxes:
   - The Add New Policy dialog box is displayed only when you are adding a new policy.
   - In the left pane of the NetBackup Administration Console, double-click on the policy name. The Change Policy dialog box displays.

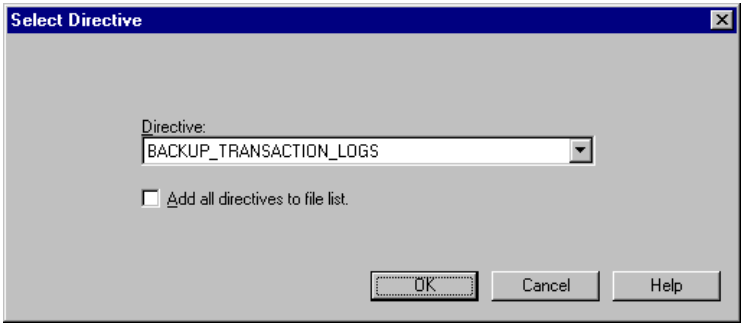
The title bar shows the name of the policy to which you are adding the file list entries.



2. Click **New** to add a file, folder, or directive to the list. Notice that two icons display in the list window.

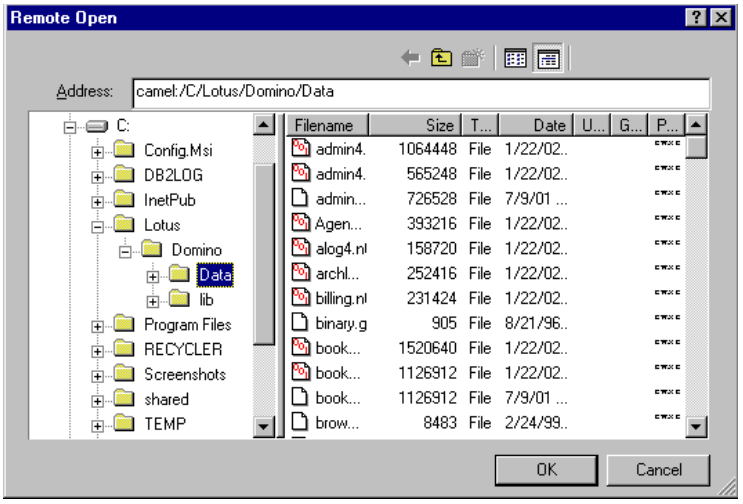
3. Indicate what you wish to back up.

   - To add a directive to the list, click the **Directive** icon. The **Select Directive** dialog box is displayed.



   Click on the **Directive** box to choose a directive from the list of directives that are valid for the policy you are configuring and click **OK**. For information about the valid directives, refer to the “File List Directives” section.

- To add a file or folder to the list, click the icon on the left. The Remote Open dialog box is displayed.



  Navigate to the appropriate folder. Notice that the path name displays in the **Address** field as it is selected. Select the desired file or folder and click **OK**.

4. To add more File list entries, repeat step 2 and step 3.

NetBackup Administration Console for UNIX

The following procedures can be performed to add and configure a policy:

- Adding New Policies
- Adding New Schedules
- Adding New File List Entries
- Adding Clients to a Policy

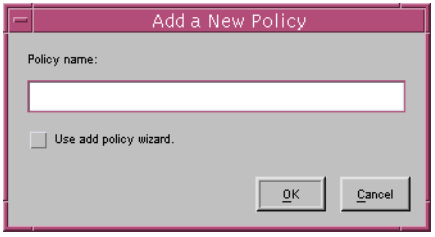
Adding New Policies

Use this procedure when configuring a policy from a UNIX server.

▼ To add a new policy

1. Log onto the server as root.
2. Start the NetBackup Administration Console.
3. If your site has more than one master server, choose the one to which you want to add the policy.
4. In the left pane, click on **Policies**. The right pane splits into a All Policies pane and a details pane.
5. In the All Policies pane, right-click on the Master Server, and click **New**.

   The Add a New Policy dialog box appears.



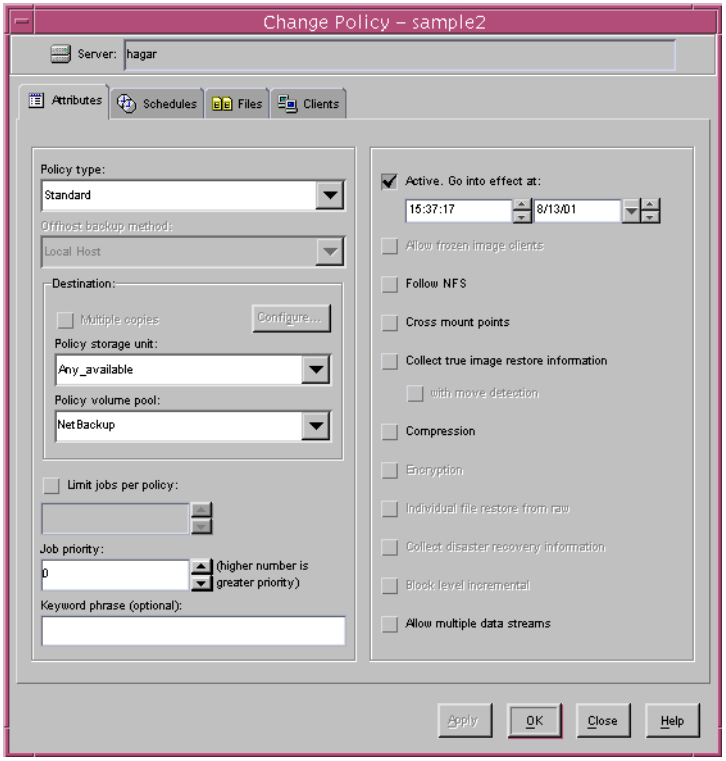
   a. In the **Policy name** box, type a unique name for the new policy.

   b. Choose whether to use the wizard for configuring the policy. The wizard guides you through the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy.

      - To use the wizard, select the **Use add policy wizard** box and click **OK**. The wizard starts and you create the policy by following the prompts. When prompted, select the Lotus-Notes policy type.
      - If you require more control over the settings than the wizard provides, do not select the **Use add policy wizard box** and proceed to step 6.

6. Click **OK**.

A dialog box appears in which you can specify the general attributes for the policy.



7. From the **Policy type** box, select the Lotus-Notes policy type.

8. Complete the entries on the **Attributes** tab as explained in "Description of Attributes" and click **Apply** to save the attribute entries.

9. Add other policy information:
   - To add schedules, see "Adding New Schedules."
   - To add File list entries, see "Adding New File List Entries."
   - To add clients, see "Adding Clients to a Policy."

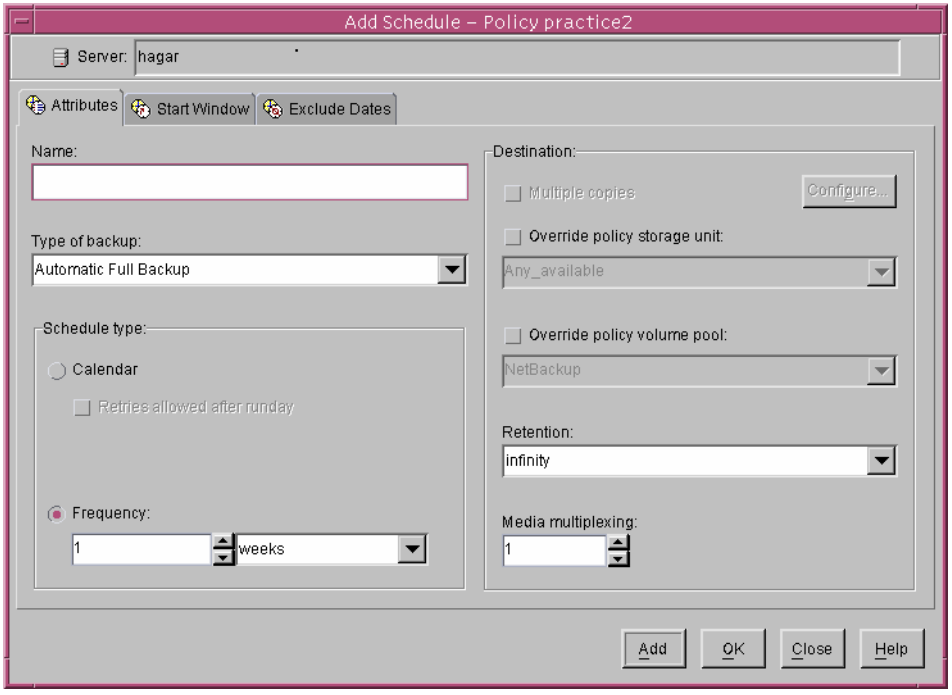
Adding New Schedules

Each policy has its own set of schedules. These schedules control initiation of automatic backups and also specify when user operations can be initiated.

▼ To add a schedule

1. In the left pane, click **Policies**.
2. In the All Policies pane, expand the policy you wish to configure. Right-click on **Schedules** and choose **New**.
3. Specify a unique name for the schedule.

   A dialog box appears. The title bar shows the name of the policy to which you are adding the schedules.



4. Select the **Type of Backup**.

   For information on the types of backups available for this policy, see "Types of Backups."

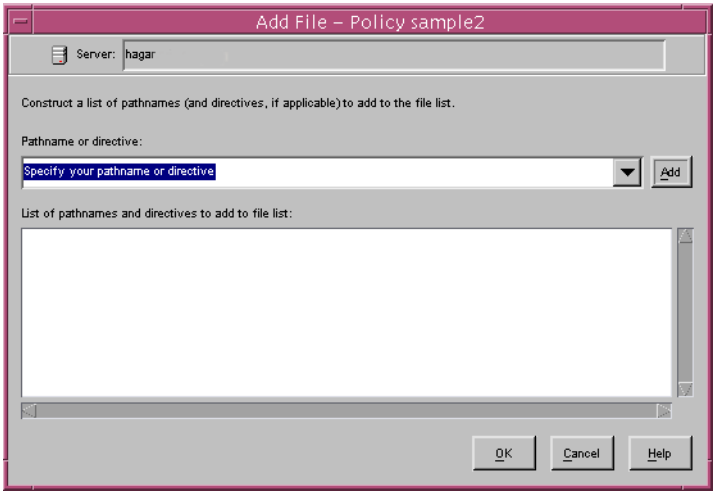
5. Specify the other properties for the schedule as explained in "Schedule Properties."
6. If this is the last schedule, click **OK**. To add more schedules, click **Add** and repeat step 3 through step 5. Click **Close** to cancel changes that you have not yet added and close the dialog box.

Adding New File List Entries

▼ To add files or directives to the Files List

1. In the left pane, click **Policies**.
2. In the All Policies pane, expand the policy you wish to configure.
3. Right-click on **Files** and choose **New**.

   The Add File dialog box appears. The title bar shows the name of the policy to which you are adding the file list entries.



4. Indicate what you wish to back up.
   - To specify a folder or file in the file list, type the name of the folder or file in the **Pathname or directive** text box and click **Add**.
   - To specify a file list directive in the file list, click the arrow button to the right of the **Pathname or directive** box, select a File list directive, and click **Add**. The File list directive is appended to the end of the File list.

     For information about the File list directives, refer to the “File List Directives”section.
5. To add more File list entries, repeat step 4.

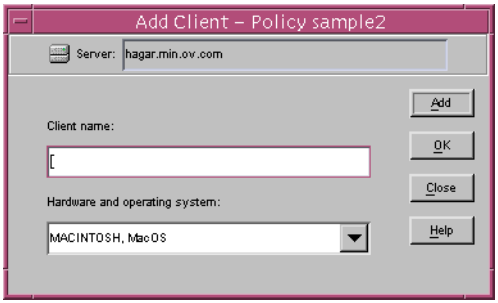
Adding Clients to a Policy

The client list is the list of clients that will be backed up during an automatic backup. A NetBackup client must be in at least one policy but can be in more than one.

▼ To add clients to a policy

1. In the left pane, expand **Policies**.
2. In the All Policies pane, expand the policy you wish to configure.
3. Right-click on **Clients** and choose **New**.

   The Add Client dialog box appears. The title bar shows the name of the policy where you are adding clients.



4. In the **Client name** text box, type the name of the client that you are adding.

   On the client the following should be installed:

   - Lotus database
   - NetBackup for Lotus Notes for Windows

5. Choose the hardware and operating system type and click **Add**.
6. If this is the last client, click **OK**. If you are going to add more clients, repeat step 4 and step 5.

Testing NetBackup for Lotus Notes for Windows Configuration Settings

After you have configured the master server for NetBackup for Lotus Notes for Windows, you should test the configuration settings. For a description of status codes, refer to the *NetBackup Troubleshooting Guide for Windows* if you are using a Windows server or the *NetBackup Troubleshooting Guide for UNIX* if you are using a UNIX server.

NetBackup Administration Console for Windows

Use this procedure to test a policy configuration from a Windows server or from the Remote Administration Console.

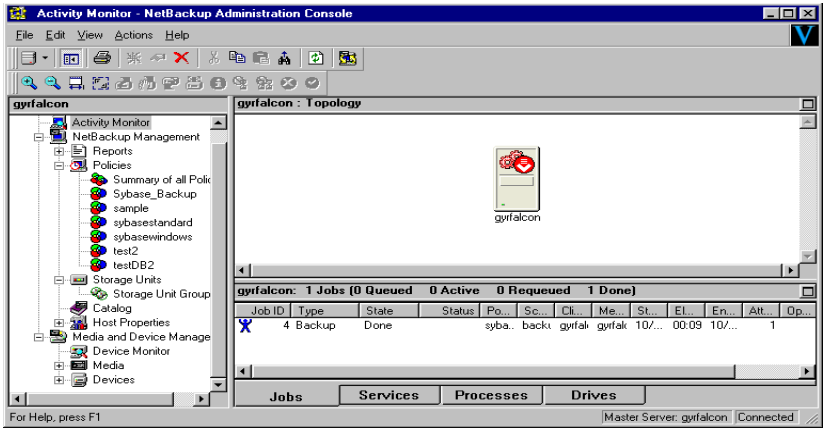
▼ To test the configuration settings on a Windows server

1. Log onto the server as administrator.
2. Start the NetBackup Administration Console.
3. In the left pane, click **Policies**. The policy list appears in the right pane.
4. Click on the policy you wish to test.
5. From the **Actions** menu, click **Manual Backup**.

   The Manual Backup dialog box appears.

   The Schedules pane contains the name of a schedule (or schedules) configured for the policy you are going to test. The Clients pane contains the name of the client(s) listed in the policy you are going to test.
6. Follow the instructions on the dialog box.

7. Click **Activity Monitor** on the NetBackup Administration Console.



If the manual backup does not exit with a successful status, refer to the Troubleshooting chapter.

NetBackup Administration Console for UNIX

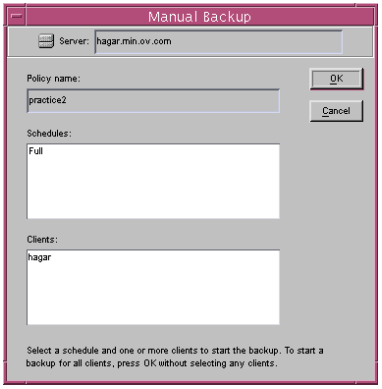
Use this procedure to test a policy configuration on the NetBackup Administration Console for UNIX.

▼ To test the configuration settings on a UNIX server

1. Log onto the server as root.
2. Start the NetBackup Administration Console.
3. In the left pane, click **Policies**.

   The right pane splits into an All Policies pane and a details pane.
4. In the All Policies pane, click the policy you wish to test.
5. From the **Actions** menu, click **Manual Backup**.

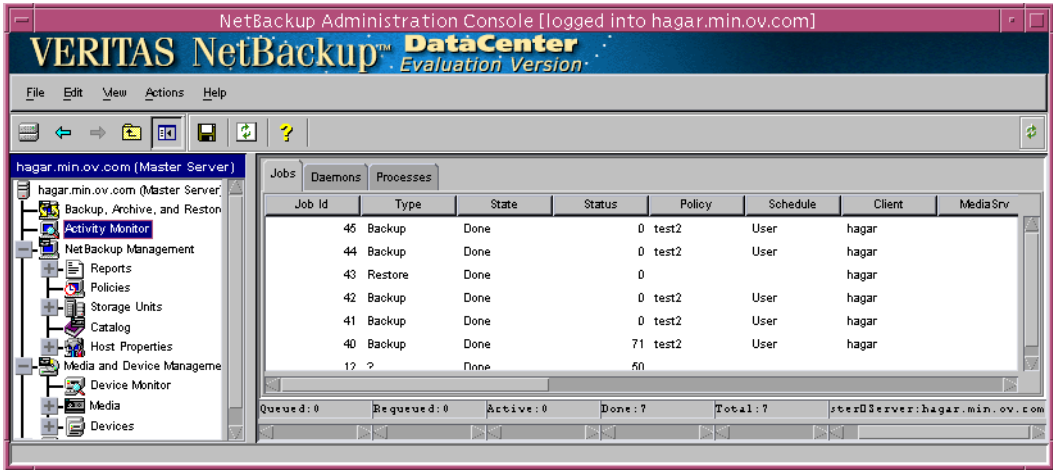
The Manual Backup dialog box appears.



The Schedules pane contains the name of a schedule (or schedules) configured for the policy you are going to test. The Clients pane contains the name of the client(s) listed in the policy you are going to test.

6. Follow the instructions on the dialog box.

7. Click **Activity Monitor** on the NetBackup Administration Console.



If the manual backup does not exit with a successful status, refer to the Troubleshooting chapter.

Operating Instructions 4

After completing the configuration, you can use the Backup, Archive, and Restore interface to back up Lotus databases, mailboxes, transaction log extents, or folders.

Performing a Backup

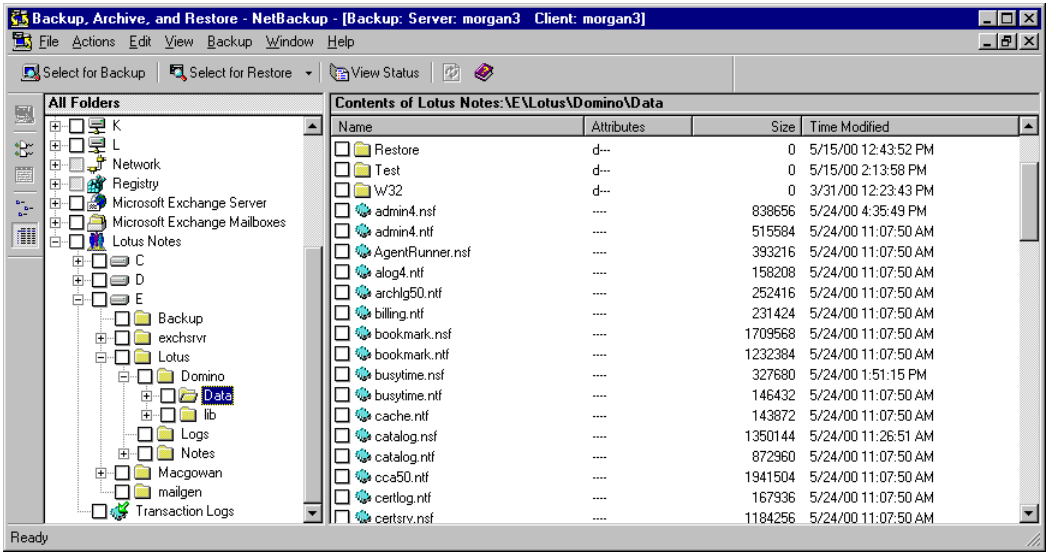
This section describes a user-directed backup of a Lotus database using NetBackup for Lotus Notes for Windows. These instructions supplement the operating instructions in the *NetBackup User's Guide for Windows*. Refer to the *NetBackup User's Guide for Windows* for detailed backup instructions.

To perform this procedure, it is assumed that you have already started the Backup, Archive, and Restore interface. Also, to perform a user-directed backup, a User Backup schedule type for a Lotus-Notes policy must have been previously configured.

Note User-directed backups will not mark backed up transaction log extents as ready to be recycled upon successful completion of the backup. Therefore, user-directed backups should be used for special situations and should not replace regularly scheduled full or incremental backups.

1. On the **File** menu, click **Select Files and Folders to Backup**.

   The NetBackup Backup window displays, with the Lotus Notes object appearing in the left pane. This object allows the user to request backups of the logged and unlogged Domino Server databases, local databases, and archive style transaction log extents, if enabled.



2. If necessary, change the NetBackup master server that will perform the backup.

If there is more than one master server to which you can send your backups, ensure that you are connected to the correct one. Ask your NetBackup administrator if you have questions about which master server to use.

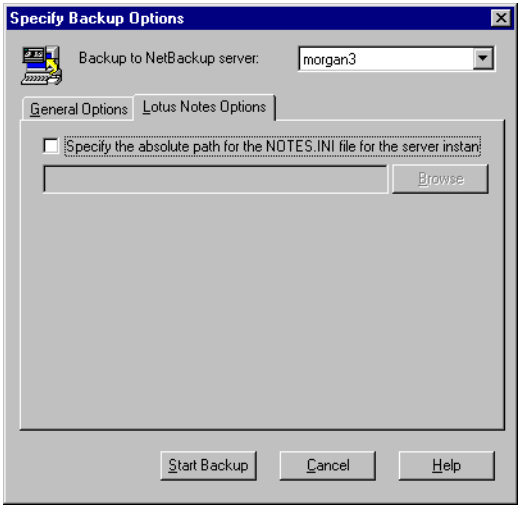
Normally, you will not have to switch master servers unless, for some reason, the administrator has temporarily moved the NetBackup backups (for example, because of a problem on the original master server). If the change becomes permanent, the administrator should change your default to reflect the other server.

3. Expand the Lotus Notes object, navigate the Lotus Notes object, and select the databases, transaction logs, or both that you want to back up.

Note It is not possible to select individual transaction log extents to be backed up. Instead, to backup transaction log extents, select the Transaction Log node of the tree. NetBackup will then query the Domino server for the list of transaction log extents that are available to be backed up.

4. On the **Actions** menu, click **Start Backup of Marked Files**.

   The Specify Backup Options dialog box appears.



   When backing up from a Domino partition server, you can specify the absolute path for the `NOTES.INI` file associated with the particular server partition that will be used to perform the backup. The server partition specified will have an impact on how a database is backed up (if logged) and which set of transaction logs will be backed up.

5. Click **Start Backup**.

Note The NetBackup operation may take a few minutes to complete.

Browse Backup Images

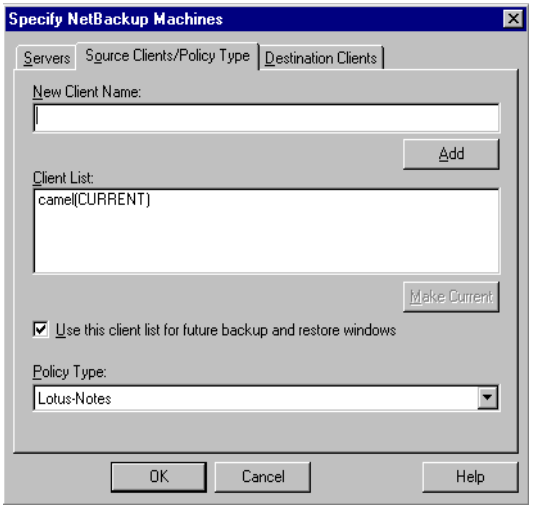
This section describes how to browse for Lotus database backup information. These instructions supplement the operating instructions in the *NetBackup User's Guide for Windows*. Refer to the *NetBackup User's Guide for Windows* for detailed browsing instructions.

To perform this procedure, it is assumed that you have already started the Backup, Archive, and Restore interface.

1. On the **File** menu, point to **Select Files and Folders to Restore**, then click **from Normal Backup**.

2. On the **File** menu, click **Specify NetBackup Machines**.

   The **Specify NetBackup Machines** dialog box will appear.



3. Click the **Source Clients/Policy Type** tab.

   a. In the **Client List** box, select the source client, then click the **Make Current** button to make the selected client the current client. The source client is the client where the NetBackup for Lotus Notes for Windows backup was performed.

   b. From the **Policy Type** list, select Lotus-Notes.

4. Click on the **Destination Clients** tab.

   a. In the **Client List** box, select the destination client from the list, then click the **Make Current** button to the make the selected client the current client. The destination client is the client to which the database should be restored. The NetBackup for Lotus Notes agent must be installed on the destination client.

5. Click **OK**.

   NetBackup will browse Lotus database backup images.

The NetBackup History pane displays Lotus database backup information. The top split window shows individual image information and the bottom split gives file and folder information, and also allows the user to select the files are to be restored.

Use the NetBackup Restore window to display information in the lower panes. The information displayed can be controlled by selecting a specific range of backup images in the top pane. For further information see the section on advanced restore procedures in *NetBackup User's Guide for Windows*.

Performing a Restore

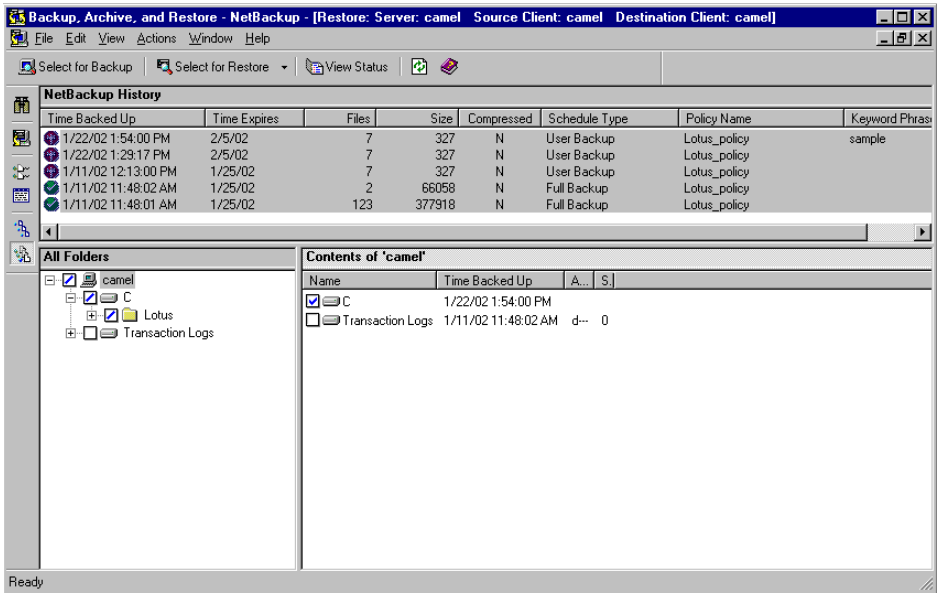
This section describes a restore of a Lotus database using NetBackup for Lotus Notes for Windows. These instructions supplement the operating instructions in the *NetBackup User's Guide for Windows*, to which you can refer for detailed restore instructions.

The following procedure assumes that you have already started the Backup, Archive, and Restore interface.

1. Browse backup images for Lotus Notes backups as described in the previous section.

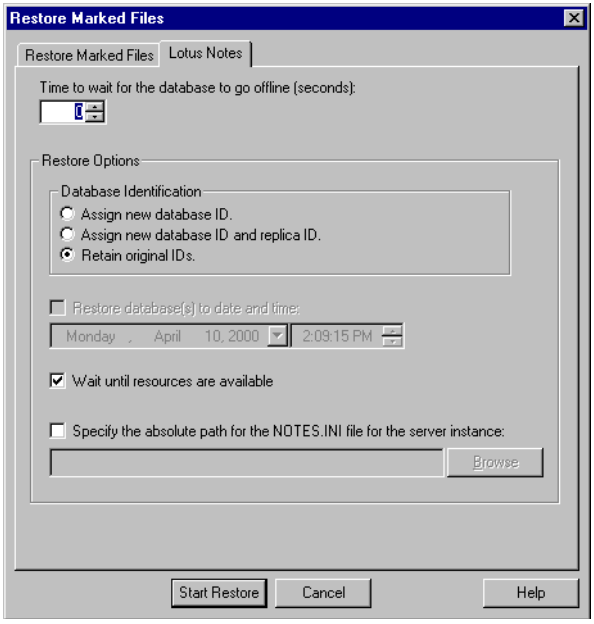
2. Select the database files you want to restore.

Note While it is possible to select transaction log extents to restore, in general, it is not recommended to do so. If a transaction log extent is required to recover a database, the transaction log extent will be restored automatically as part of the database recovery and recycled automatically by the Domino server when the transaction log extent is no longer required.



3. On the **Actions** menu, click **Start Restore of Marked Files**.

The **Restore Marked Files** dialog box appears, with the **Lotus Notes** property page displayed.



4. Enter the following information as described below:

   - **Time to wait for the database to go offline**: This field allows the user to specify the number of seconds that the restore process will wait for a busy database. When a Lotus database is to be restored it needs to be taken offline. This will ensure that the database is not being accessed, close the database, and delete the database. If the database is being accessed it cannot be taken offline. If the database is still busy and not able to be taken offline after the specified wait time, the restore of that database will fail.

   - **Database Identification**: The user can assign a new database instance ID (DBIID), assign a new database instance ID (DBIID) and a new replica ID, or retain the original database instance ID (DBIID) and replica ID during the restore.

     The replica ID is used to synchronize two or more databases that are being replicated in the Lotus Domino environment. The user may select to assign a new replica ID during a restore to prevent the other database(s) under replication from replicating over the restored database files.

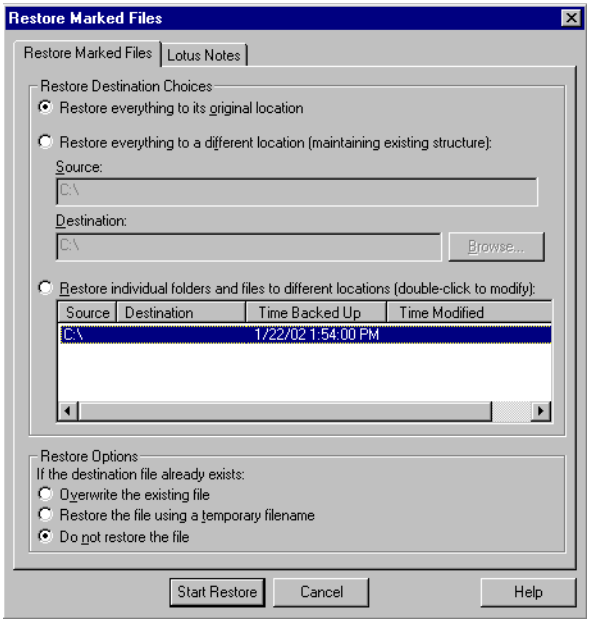
   - **Restore database(s) to date and time:** If the user selects to assign a new database instance ID (DBIID), or assign a new database instance ID (DBIID) and a new replica ID, the user will have the option to recover the selected database(s) to a specific point in time.

     The user will click the **Restore database(s) to date and time** checkbox to enable the date and time controls. The date and time can now be set for the restore process.

   - **Wait until resources are available:** Click this checkbox to wait for Lotus Domino Server Resources to become available before starting the restore process.

   - **Specify the absolute path for the NOTES.INI file for the server instance**: When restoring on a Domino partition server, the user can specify the absolute path for the `NOTES.INI` file associated with the particular server partition that will be used to perform the restore. The server partition specified will have an impact on how a database is restored (if logged) and which set of transaction logs will be used for recovery.

5. Click on the **Restore Marked Files** tab.



The **Restore the file using a temporary filename** option is not available when restoring a Lotus database.

6. Click **Start Restore**.

Lotus Domino Clustering

Domino clustering technology can provide high availability, load balancing, and scalability for your Lotus Domino environment. Domino clustering uses event-driven replication to keep data in all Domino servers in the cluster in sync. Domino clustering is a type of "software" clustering. As such, Domino clustering provides failover of databases to an available Domino server. Domino clustering does not provide failover of the Domino server itself, as would be expected in a "hardware" clustering environment.

Up to six Domino servers within the same Notes domain may exist in a Domino cluster. A Domino server may be a member of a single Domino cluster; however, a Notes domain may have more than one Domino cluster.

Lotus Domino Clustering Components

Several components work together to control a Domino cluster. These include the Cluster Manager, the Cluster Database Directory, the Cluster Database Directory Manager, and the Cluster Replicator.

The *Cluster Manager* runs on each server in a Domino cluster and monitors the state of the other Domino servers in the Domino cluster. The Cluster Manager performs the following tasks: 1) determines which Domino servers belong to the Domino cluster, 2) monitors for server availability and workload, 3) fails over database requests due to unavailability of a Domino clustered server, and 4) performs workload balancing.

The *Cluster Database Directory* (CLDBDIR.NSF) is replicated on every server in a Domino cluster. The Cluster Database Directory contains information such as file name, server, replica ID, cluster replication status, and out of service information for each database on each Domino server in the Domino cluster. The different cluster components use this information to perform their tasks.

The *Cluster Database Directory Manager* (CLDBDIR) task on each Domino server manages the Cluster Database Directory and keeps it up-to-date. The Cluster Database Directory Manager also monitors the status of each database to determine if they are out of service or pending delete.

The *Cluster Replicator* (CLREPL) task constantly synchronizes the database replicas in a Domino cluster. Because the Cluster Replicator is event-driven, rather than schedule-driven, as in traditional replication, changes that occur to a database in the Domino Cluster are immediately pushed to the other replicas in the Domino cluster. This ensures that each time a database is accessed they contain the most up-to-date data. The Cluster Replicator task will push changes only to those Domino servers in a Domino cluster. The traditional scheduled replication is used to replicate changes to and from Domino servers outside a Domino cluster.

Because Domino stores replication events in memory only, both the source and destination servers must be available for the replication to complete successfully. If a destination server is not available, the Cluster Replicator task on the source server will continue to store the replication events in memory until the destination server becomes available. If the source server shuts down before the replication completes, the replication events in memory will be lost. To prevent this loss of data, standard replication should be configured to perform immediate replication with all members of the Domino cluster whenever a Domino cluster server is restarted. It is also recommended that scheduled replication between Domino clustered servers be performed on a regular basis to help maintain database consistency for all members of the Domino cluster.

Backing up a Lotus Domino Replicated or Clustered Environment

If using transaction logging, it is recommended that when configuring your Domino cluster environment:

- Archive style logging be enabled on the Domino server that will function as your backup server.
- Circular style logging be enabled on all other Domino servers in the Domino cluster.

  By running circular style logging on the non-backup Domino servers, all the advantages of transaction logging such as data reliability and integrity and improved Domino server performance can be attained without having to manage (recycle) the archival-style transaction logs.

It is also recommended that such non-database Domino files such as the `NOTES.INI`, user and server certificates ids, the `CLUSTER.NCF` file also be backed up as part of the standard backup.

Restore/Recovery in a Lotus Domino Replicated or Clustered Environment

Because Domino clustering is a “software” clustering solution that relies on software replication to provide consistency of the databases across all members of the Domino cluster, the replica ID plays an important role in achieving the expected results when attempting to restore a Domino database from backup. Understanding how replication functions is vital to achieving the expected result. The following examples illustrate two possible restore / recovery scenarios.

Example 1

The environment is a Lotus Domino Clustered environment with four Lotus Domino servers as members of the Domino cluster. Server A is identified as your backup server and is running archive style transaction logging. Servers B, C, and D are running circular style logging. To provide load balancing across all the Domino servers, replicas of all databases exist on all four servers in your Domino cluster. A successful full backup of all databases was completed earlier in the week. Successful incremental backups of the archival-style transaction logs are completed every four hours, with the last one completing 2 hours ago. At 2:30 pm, a user complains that the database `ACME.NSF` has become corrupted, while modifying the database on server C over the last 30 minutes. Unfortunately, because the environment is a Domino cluster environment, the corruption has been replicated to all four member servers. The user states that the database was in a consistent state when he began modifying the database.

▼ **To restore the database to a consistent state:**

1. On server A, perform a point-in-time recovery of the database `ACME.NSF`. Select the database `ACME.NSF` from the last successful backup of the database (eg. the full backup completed successfully earlier in the week). Begin the restore.

2. On the **Lotus Notes** tab of the Restore Marked Files dialog box, select the **Assign new database ID and replica ID** option, select the **Restore database(s) to date and time** option, and specify today's date at 2:00 pm (the time the user started modifying the database) as the point-in-time for recovery.

3. After the restore / recovery is successful, a version of `ACME.NSF` recovered to today at 2:00 pm should exist on server. Verify the consistency of `ACME.NSF` on server A. If all is as expected, from server A create new replicas of `ACME.NSF` on servers B, C, and D. Cluster replication on a consistent version of `ACME.NSF` should now be functional on servers A, B, C, and D.

Example 2

The environment is a Lotus Domino Clustered environment with three Lotus Domino servers as members of the Domino cluster. Server C is identified as your backup server and is running archive style transaction logging. Servers A and B are running circular style logging. To provide high availability and load balancing of mail, replicas of all mail databases between A-L exist on servers A and C and replicas of all mail databases between M-Z exist on servers B and C. A successful full backup of all databases was completed earlier in the week. Successful incremental backups of the archive style transaction logs are completed every four hours, with the last one completing 2 hours ago. A user complains that he has just realized that yesterday afternoon about 3:30 pm he deleted 30 mail messages from his mail database `MANDER.NSF` that should not have been deleted.

▼ **To recover the accidentally deleted mail:**

1. On server C, perform a point-in-time recovery of the database `MAIL\MANDER.NSF`. Select the database `MAIL\MANDER.NSF` from the last successful backup of the database (e.g., the full backup completed successfully earlier in the week). Begin the restore.

2. On the **Lotus Notes** tab of the Restore Marked Files dialog box, select the **Assign new database ID and replica ID** option, select the **Restore database(s) to date and time** option, and specify yesterday's date at 3:25 pm (the time just prior to when the user deleted the mail messages) as the point-in-time for recovery.

3. After the restore / recovery is successful, a version of MAIL\MANDER.NSF recovered to yesterday at 3:25 pm and containing the deleted messages should exist on server C. Verify the existence of messages in MAIL\MANDER.NSF on server C. If all is as expected, copy the accidentally deleted messages from MAIL\MANDER.NSF on server C to the database on server B.

4. After the copy, verify the existence of the messages in MAIL\MANDER.NSF on server B. If all is as expected, from server B create a new replica of MAIL\MANDER.NSF on server C. Cluster replication should now be functional for MAIL\MANDER.NSF on servers B and C.

It is important to note in the example above that the **Assign new database ID and replica ID** option was chosen. If the **Assign new database ID** option had been chosen instead, the final results of the recovery would have been very different. As in the example above, the restore of the database MAIL\MANDER.NSF functions the same, except the replica ID is not changed. The database would have then been recovered to the specified point-in-time. However, because the replica ID of the database MAIL\MANDER.NSF on server C had not been changed as part of the restore, the replica ID of the database on server C still matches the replica ID of the database on server B. Therefore, all the changes to the database between the point-in-time the database was recovered to and the current time, including the deletion of the 30 mail messages, will eventually be replicated from the database on server B to the database on server C. The final result will be two identical copies of the database MAIL\MANDER.NSF, one on server B and the other on server C, that are the same as when we started restoring the database MAIL\MANDER.NSF on server C.

Troubleshooting NetBackup 5

The NetBackup master server and client software offers a comprehensive set of debug logs for troubleshooting problems that may occur during NetBackup operations. Debug logs are covered in detail in the *NetBackup Troubleshooting Guide for UNIX* and the *NetBackup Troubleshooting Guide for Windows.*

If you are experiencing problems backing up or restoring databases or transaction logs, and the cause of the problem cannot be determined from standard NetBackup progress reports, you may enable NetBackup debug logs to aid in determining the cause of the problem. Debug logging is enabled by creating certain folders under the NetBackup `Logs` folder.

The following topics cover troubleshooting of NetBackup:

- Backup Operation Debug Logging
- Restore Operation Debug Logging
- Changing the Debug Level
- Viewing the Status of a NetBackup Operation

Backup Operation Debug Logging

To turn on debug logging for backup operations, create the following folder:

install_path`\NetBackup\logs\bpbkar`

After creating this folder and performing a backup, debug logging information will be placed in the following file:

install_path`\NetBackup\logs\bpbkar\mmddyy.log`

Restore Operation Debug Logging

To turn on debug logging for restore operations, create the following folder:

install_path\NetBackup\logs\tar

After creating this folder and performing a restore, debug logging information will be placed in the following file:

install_path\NetBackup\logs\tar\mmddyy.log

For details on the contents of these debug logs, refer to the *NetBackup Troubleshooting Guide for Windows* or the *NetBackup Troubleshooting Guide for UNIX*. After the cause of the problem has been determined, debug logging can be disabled by removing the previously created debug logging folders.

Note When debug logging is enabled, the files can become large. The same files are used by normal file backups.

Changing the Debug Level

You can control the amount of information written to the debug log in the *install_path*\NetBackup\logs\bpbkar folder by changing the General debug level. The higher the value, the more information is logged. In everyday normal operations, the default value of 0 is sufficient. However, VERITAS technical support may ask you to set the value higher when a problem is being analyzed.

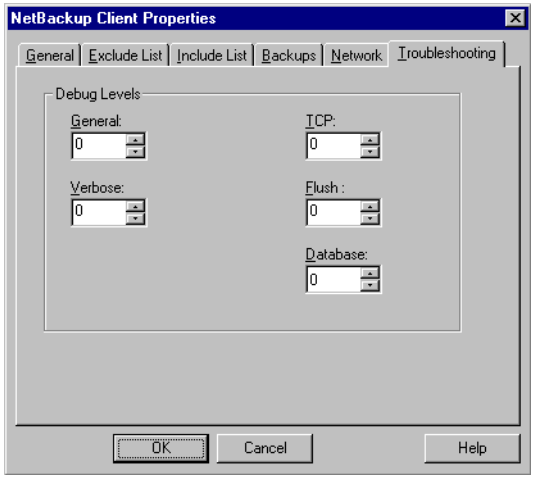
▼ To change the Debug Level

1. Click on the Windows **Start** menu, point to **Programs** and **VERITAS NetBackup**, then click on **Backup, Archive, and Restore**.

   The Backup, Archive, and Restore - NetBackup window appears.

2. On the **File** menu, click **NetBackup Client Properties**.

3. Click the **Troubleshooting** tab.



By default, the settings are zero.

4. Set the **General** debug level.

5. Click **OK** to save your changes.

Viewing the Status of a NetBackup Operation

NetBackup provides many standard status reports to verify the completion of backup and restore operations. In addition, users and the administrator can set up additional reports if a site requires them.

NetBackup Client Reports

The administrator has access to operational progress reports through the NetBackup Administration Console. Reports may be generated for Backup Status, Client Backups, Problems, All Log Entries, Media Lists, Media Contents, Images on Media, Media Logs, Media Summary, and Media Written. These reports may be generated for a specific time frame, client, or master server. Refer to *NetBackup System Administrator's Guide for UNIX* or *NetBackup System Administrator's Guide for Windows* for details.

Progress Reports

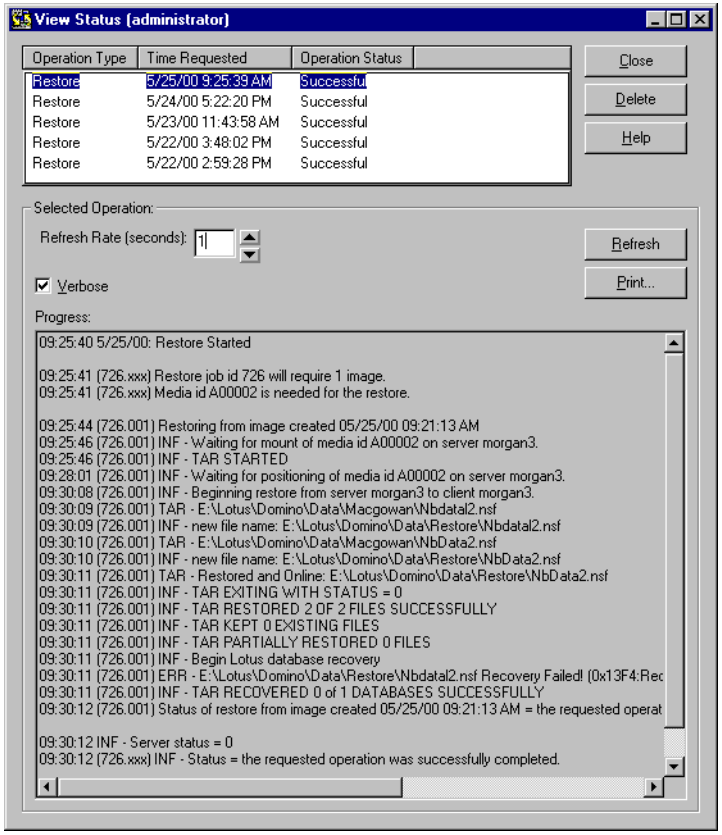
Progress reports on the client allow easy monitoring of user operations. When reports are created by the NetBackup client for each user-directed backup or restore operation, administrators can monitor these operations and detect any problems that may occur.

▼ To view the status of an operation

1. On the **File** menu, click **View Status**.
2. Click on the task for which you want to check the progress.
3. Click **Refresh**.

   The status of the operation is displayed in the lower pane.

   Status of restore operation



When `the requested operation was successfully completed` message appears, the NetBackup operation is finished. (See your *NetBackup User's Guide for Microsoft Windows* for further information on progress report and the meanings of the messages.)

Index